Fresh Air Intake Pre-filtering Device for Make-Up Air

Field of the invention

This invention is in the field of furnace forced air heating, air circulation for Make-up air

Background of the invention

A supply of make up air and combustion air is required for buildings with furnace forced air heating that have a combustion chamber burning natural gas or oil fired, houses that are made air tight
Rely on this air supply to maintain a Neutral or positive pressure so products Of combustion don't enter the home.
While the forced air furnace fan is operating it will draw in through the fresh air intakes up ward of 80 to 125 cfm or what calculates in to 10% of the make-up air required for the building and that particular furnace circulating system.
Where screens are required on air intakes Supplying make up air, Code: the screens less then1/4" or 6mm its gross area shall be three times greater then the duct it serves they shell be removable with out any special tools and made of a none corrosion resistant material

In the prior art, several devices have Been introduced for supplying make-up air to the forced air furnace circulating system is shown Kogut U.S. Pat. No.-4,509,681,McCarty U.S.Pat.No.-4,175,538, SeppamakiU.S.Pat.No.4, 735,130 and RoyU.S.Pat.No.5, 257,736 these devices are known to use the same standard screen ¼" or 6mm square openings and are not removable for cleaning on there fresh air intakes for combustion and

Make-up air, Screens of this nature are known to have plugged up with debris, freezing up with frost and snow, imposing difficulty on the air intakes to supply the make-up air, creating a negative pressure allowing products of combustion into the home, possibly at an unsafe levels. Studies show these air intakes have created a build up over the years by allowing spiders, Files, moths, ant, mice, pollens, dust mites, allergens, and air borne bacteria to enter the furnaces circulating system, the accumulation and confinement has raised some health concerns.

Objects of the Invention

It is the general object of the invention to provide a fresh air intake that will over come the above noted disadvantages in the make-up air circulating system.
It is another object of the invention to create a supply of better quality make-up air supply for the home.
It is another object of this invention to prevent freezing and plugging up by the outside elements.
Another object of this invention is to create, without any special tools required a screen easily removed and replace for cleaning.

Summary of the Invention

This invention is directed to a furnace Forced air heating make-up air circulating system for a building, relates more to residential homes. This is accomplished by a pre-filtering device being mounted on an out side wall of a building, and connected to the make-up air inlet conduit to the return air duct.

Continued

Further, in accordance with this invention while the furnace fan is operational the 10% of make-up air required is being drawn through the pre-filtering device stopping most pollutions such as dust mites, pollens, allergens, and air borne bacteria as well as spiders, flies, moths, ants, mice, etc, before entering through the wall an into the conduit to the return air duct, this allowing a better quality make-up air.

Further in accordance with this invention an aluminium frame, raised pattern grill allows in the winter months the frost to build up a then lets it dissipate through filter media

Further in accordance with is invention there are no special tools required for removing or installing clean the screen for servicing.

In the following detailed description and drawings that follows a more complete understanding of the invention will be obtained.

Description of the Drawings

Fig. 1 shows a side evaluation view of the pre-filtering device with its specification's

Fig. 2 is a side evaluation view showing the embodiments of the invention

Fig 3 this is a view of showing a one-piece housing and flange for mounting On an outside wall with the pull tap for releasing the filter.

Fig 4 is showing a rear view that's placed against the wall for mounting as well as the groove in the inverted flange a filter

Fig. 5 this is the same as no. 4 showing the inverted flange and depth of the intake opening

Fig.6 shows a side evaluation view of how the filter is installed and uninstalled with a view of the filter and screen with its raised pattern.

Detailed Description of Preferred Embodiments

Referring to the drawings a fresh air intake pre-filtering device 2 is a one piece polyethylene injected moulded device mounted 1 on an outside wall, not shown, by placing the conduit through a hole in the wall, not shown, into 5 the recessed grove of the inverted flange connects the present invention to the conduit for the make-up air on new installations, by removing the rain cap off an existing metal air intakes, the present invention can be mounted flush due to the inverted 5 flange.

The present invention's screen and filter are easily removed for cleaning with out need for special tools by pulling the 3 tabs at the front of the device releases the 8 filter, to reinstall the filter, insert the 8 filter towards the back on a thirty degree angle resting it on the two 6 rear tabs then raising the front to lock it in tight against 4the seat by the two rear tabs at the rear of the 3 front pull tab for releasing the filter

This pre-filtering devices 8 filter requirements is the frame an 9 screen had to be of corrosion-resistant material, filter media had to be moisture resistant and low initial resistance, since filter media is known to freeze up. In using a 7.500" by 8.00" Aluminium frame and 9 raised pattern screen, a polymed media made of 100% synthetic fibres using three eights media allowing .06 w.g. initial restriction

At 100 cfm, this combination that makes up this filter allows the pre-filtering device to function dealing with the out side elements, this is accomplished by the 9 raised pattern screen in the winter by allowing the frost to build up, keeping it off the media and leaving opening for the air to flow through evaporating the frost like a self defrosting fridge as the temperature is the same on both sides of the 8 filter.

Harry Li P.Eng.,M.Sc. calculated filter size required

Hydro-Air Technical services measured airflow and volume